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ABSTRACT

This paper focuses on the development, adoption, and integration of resource discovery, knowledge management, and/or knowledge sharing interfaces such as interactive portals, and the use of the library's World Wide Web presence to increase the availability and usability of information services. The introduction addresses changes in library services due to information technology and summarizes the three basic functions that comprise the knowledge mediation function of the library. The first section discusses portals as an access tool and lists several types of portals, i.e., Consumer Portals, Vertical or Niche Portals, Affinity Portals, Horizontal Portals, Enterprise Resource or Corporate Portals, and B2B or Industry Portals. The second section addresses knowledge management, including trends that play a significant role in the current knowledge economy. The third section discusses the evolution of the library Web site to portal. The fourth section describes the portal development program at the Australian National University for Scholarly Information, including examples of library portals and a schematic representation of the database structure. The final section considers future challenges. (Contains 12 references.) (MES)

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Resource Discovery Within the Networked 'Hybrid' Library

By: Sally-Anne Leigh

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Proceedings

Resource Discovery within the Networked 'hybrid' library

Sally-Anne Leigh

Today's 'hybrid' libraries provide substantial resource functions, providing pathways for users through the maze of knowledge sources and networked information systems that are now available in the modern academic library. Libraries are becoming combined information technology and information access points with services no longer restricted to time and place. Information delivery to the desktop is the expectation rather than the hope.

This represents a substantial historical shift from traditional library information service models to something new and exciting. The field of scholarly publishing and the notion that libraries should in fact be producers and value-adders rather than simply enablers is becoming the norm. Information and network technologies are important tools in furthering continuing development of increased information access needs. A shift from traditional collection based services to a broader mix of services including networked information access is occurring.

This paper will focus on the development, adoption and integration of resource discovery, knowledge management and/or knowledge sharing interfaces such as interactive portals and the use of the libraries web presence to increase the availability and useability of information services.

Traditional barriers to the access of information sources are becoming more and more diminished, thanks largely to the nature of the Internet and the myriad of information technologies, which allow us to retrieve, store and disseminate information.[i] Resource discovery developments such as search engines, subject gateways, portals, enhanced sites, site-to-site and site to people link provide greater access to information than ever before. The "global virtual library", allows library collections in different part of the world to be accessed and shared digitally.[ii] To survive, individual libraries must "add value" to this resource-sharing network.

Libraries act as a linkage between knowledge sources and users. Too often we view libraries as an entity in themselves rather than as merely a service gateway to information. The knowledge mediation function of the library comprises three basic functions:

- Providing a window on available knowledge through a wide variety of sources within the library holdings;
- Actually providing materials to the user once they have decided exactly what they need; and
- Offering users various kinds of support related to the complex processes of knowledge mediation and acquisition.[iii]

Libraries are no longer bound by time and space in their provision of information. Users not longer depend on libraries but increasingly they depend on access to information. The differentiation between Internet and library resources from a user perspective is rapidly disappearing. The role of a "New Age" library will be very much an intermediary between end-users and commercial publishers. Dynamic documents that process information must include resource discovery standards such as metadata and links to external elements and tools.

Portals as an Access Tool

The term "portal" is relatively new and began to be used by mega-sites such as Yahoo, Excite, Netscape and many other large heavily visited sites. In its raw form it is nothing more than an entry point or a starting gate for web surfing. The term "search engine" has become inadequate to

describe the breadth of the offerings of these leading Internet destinations, although search and navigation are still pivotal to people's online experiences.

In its most simplistic format, portals gather a variety of useful information resources into a unified "one-stop web shop" helping users to overcome the "information overload". Portals can be customized, a futuristic change from the traditional profiling services. A library portal can allow an individual's web experience to be more efficient and make the institution more efficient and productive as a whole.[iv]

Portals are a way of leveraging a site for communal access of information. Traffick.com's Guide to Portals[v] lists several types of portals:

- **Consumer** Portals; which offer a wide range of customisation options and functionality including: internet search and navigation, email, customised news, calendars and contact managers, bookmark managers to save favourite web sites, real-time chat, intranet functionality and much more;
- **Vertical** (Vortal) or Niche Portals; category based web sites that are popular and economically significant, "subject gateways" are a type of vertical portal;
- Demographically-focussed portals which cater to specific ethnic group, age groups, alternative lifestyles and other groups are being called **Affinity** Portals;
- **Horizontal** Portals are general interest portals covering a wide range of topics and features such as Yahoo and Lycos;
- Enterprise Resource Portals (**ERP**), Enterprise Information Portals (**EIP**) or **Corporate** Portals or once called the "extranet"; and
- **B2B** or Industry Portals are those in the corporate sector that can act as real engines for the new economy, particularly those who advocate e-commerce.

For libraries as with other organisations, simply applying these technologies does not create an attitudinal system of knowledge sharing. Information is as much about access as about quality. Information discovery, information organisational and information sharing is crucial for the sustainability of information services within libraries.

Information portals or format-specific portals, a term more frequently used in Australia have three fundamental purposes: to provide convenient and effective access to information resources through a single gateway; describe resources according to agreed-upon standards after selection for quality and subject content; and identifying information resources to agreed-upon content guidelines.[vi] Information portals help collect, filter and deliver data in real-time. Information portals are the next generation intranet, a point of aggregation for fragmented data and documentation posted on the Internet.[vii]

However, the current trend in the supply of electronic information particularly those favouring vendor-aggregated content providing "MyPortal" services and technologies do not necessarily suit the library user. Library users do not know nor should be expected to know which title has been acquired from which vendor. Rather they need to be provided with a strategy to "implement site-wide subject searching, or browsing, that would result in a single page displaying links to all types of electronic information on a given topic drawn from many places on the Web site".[viii] Good examples of Library wide portals include: University of Washington's MyGateway http://www.lib.washington.edu, University of Melbourne's Buddy http://xena.lib.unimelb.edu.au/bud/dir/budhome.html, and University of Arizona's SABIO http://www.library.arizona.edu.

Knowledge Management

Knowledge management has recently been used to represent a myriad of concepts in recent years. As a standalone buzzword, it is however almost meaningless. There has been a huge amount of information published about this topic in recent years but not necessarily in relation to libraries. It

has largely been applied to organisational change and innovation. Libraries are however, increasingly becoming aware of the relevant of this field of study. Nomenclatures are changing. Chief Librarians are becoming "chief knowledge officers", librarians are becoming "knowledge workers". There are some broad trends that are currently playing a significant role in the current knowledge economy:

- The globalisation of the economy which is putting terrific pressure on organisations for increased adaptability, innovation and process speed;
- The awareness of the value of specialised knowledge, as embedded in organisational processes and routines; and
- Cheap network computing which is at last giving us a tool to work with each other.[ix]

The difference between information and mis-information is central to the work of librarians. Libraries are still mainly called libraries, but in this modern age they should be referred to as "Information Centers". People often use libraries simply to find out what different people have said on a question. Information is a valuable commodity but it has to be believed, be from a valid source and be reliable. Library catalogs often reveal little about the content of a libraries collection, a breadth of sources must be investigated. Librarians often see their's as a traditional role, to provide information about a variety of sources, describe and make them accessible. The reality of the library system is to provide their clients with the information that they find subjectively satisfactory. The major role of the "knowledge enabled" library should be to supplement the material provided rather than simply provide access to it.[x] Technology provides a way of increasing the breadth and scope of information, other than the traditional catalog system, library web sites and the development of subject gateway's and portals which can provide a way forward.

From Static Web Site to Portal

More than ever, the Library web site is the gateway to the breadth of information that a library has to offer. Web Sites now play a central role in meeting the library's mission of delivering information and services, a role that it did not play a number of years ago. Libraries must understand that web managers and electronic resource positions are no longer a one-person job. Thus, whether or not they are conscious of this evolving dynamic, libraries are taking steps to address the substantial technical and organisational challenges posed by the second-generation web.[xi] Web sites are continually evolving and the library web presence is even larger within the new age context. The Library's web site is the gateway and the point of integration for library resources and services for both local access and remote users. Unless catalogs include a myriad of electronic, both subscribed and non-subscribed resources they risk being marginalised.

User expectations are becoming increasingly higher, they expect value added services, easy to use interfaces and want to browse the catalog using the same tools and techniques as they use to manage their other information investigations. Users want tailored information, suited to their needs at that specific time and place.

Library Web sites contain a wide variety of information; local information, locally hosted databases, internet resources and a wide range of library holdings.

Every query to a search engine or form submission uses CGI (common gateway interface) scripting typically in PERL, PHP or TCL technologies behind the scenes. "To move forward, libraries must stop thinking of their web sites as collections of HTML pages and view them as dynamic resources for information and services that patrons will use in highly individualised ways".[xii] Dynamic technologies are required to create "on-the-fly"/real-time access using push/pull technologies that allow for data to be manipulated into the pages as they are delivered. The server-side include (SSI) feature of Web servers makes this possible. Vendor specific application server software delivers core functionality, which generally requires substantial modifications.

Decisions need to be made as to whether there is sufficient internal expertise or whether development has to be outsourced. Once the site is established how is it directed, maintained and

refreshed is a resource intensive question. By using off-the-shelf tools or licensing enterprise portals, institutions will be able to share technologies by making open source code available.

A good portal or gateway should provide seamless access for non-authenticated users until restricted information is requested and then when it is, the system prompts the user for a username and password. Unlike internet and intranet sites, most portals are proprietary providing application programming interfaces (API's). Underlying technologies such as Web browsers, Java and email solutions are examples of open standard solutions that should be developed and/or integrated.[xiii] A good portal should be able to work with the existing Web servers. By using customised HTML tags and Java taglets, Html developers can add not only security but also dynamically generated content.

The Portal Development Program at the Australian National University for Scholarly Information

A portal development program[xiv] has been established within the Information Division at the Australian National University (ANU), as a three-year staged program to facilitate improved access to scholarly information. By providing timely access to electronic information delivered to the desktop rather than the traditional print based materials, the scholarly information paradigm will change dramatically. Information access will be provided through generic and specific portals and supported by local and distributed physical facilities and training programs.

Web of Science will provide a major information source and gateway. Subject based portals/gateways to the web will be developed within the following categories: Science (Physics, Maths, Chemistry, Engineering/IT and BioMed), Humanities and Social Sciences Portal - General, Music and Art Portal, Economics and Business Management Portal (Social Sciences - Asia Pacific) and Law. These portals will be developed to provide easy access and to build sustainability of access to electronic information in the process.

The program has been designed to facilitate a change to scholarly communication with an emphasis on access and usage rather than ownership. The program will be a change agent for user behaviour. As users already have an expectation of 24x7 service and information access delivery to the desktop, libraries must respond to the challenge. There will be a move from the provision of traditional print based resources to the provision of electronic resources. Bridging funding has been allocated to facilitate this change mechanism. The implementation process will be informed by user needs and a major facet of the program is the determination of the value and priority placed on particular sources of scholarly information by the academic community.

A Portals Implementation Team was established to manage and co-ordinate this change. The team consisted of a Project Manager, a Portal Development Co-ordinator, a Web Developer, a User Interface Co-ordinator, Technical Support, and an Electronic Services Co-ordinator.

By evaluating what other institutions are doing and/or what is available in the marketplace a decision is being made whether to develop an in-house solution or to utilise and customise and existing solutions. By far the most common type of portals developed by universities appears to be campus-wide solutions rather than those simply focussing on access to library resources. There are quite a number of examples including Monash University, University of Minnesota, California Institute of Technology, and the University of Michigan who as part of their campus-wide portal have integrated their library resources into a single database.

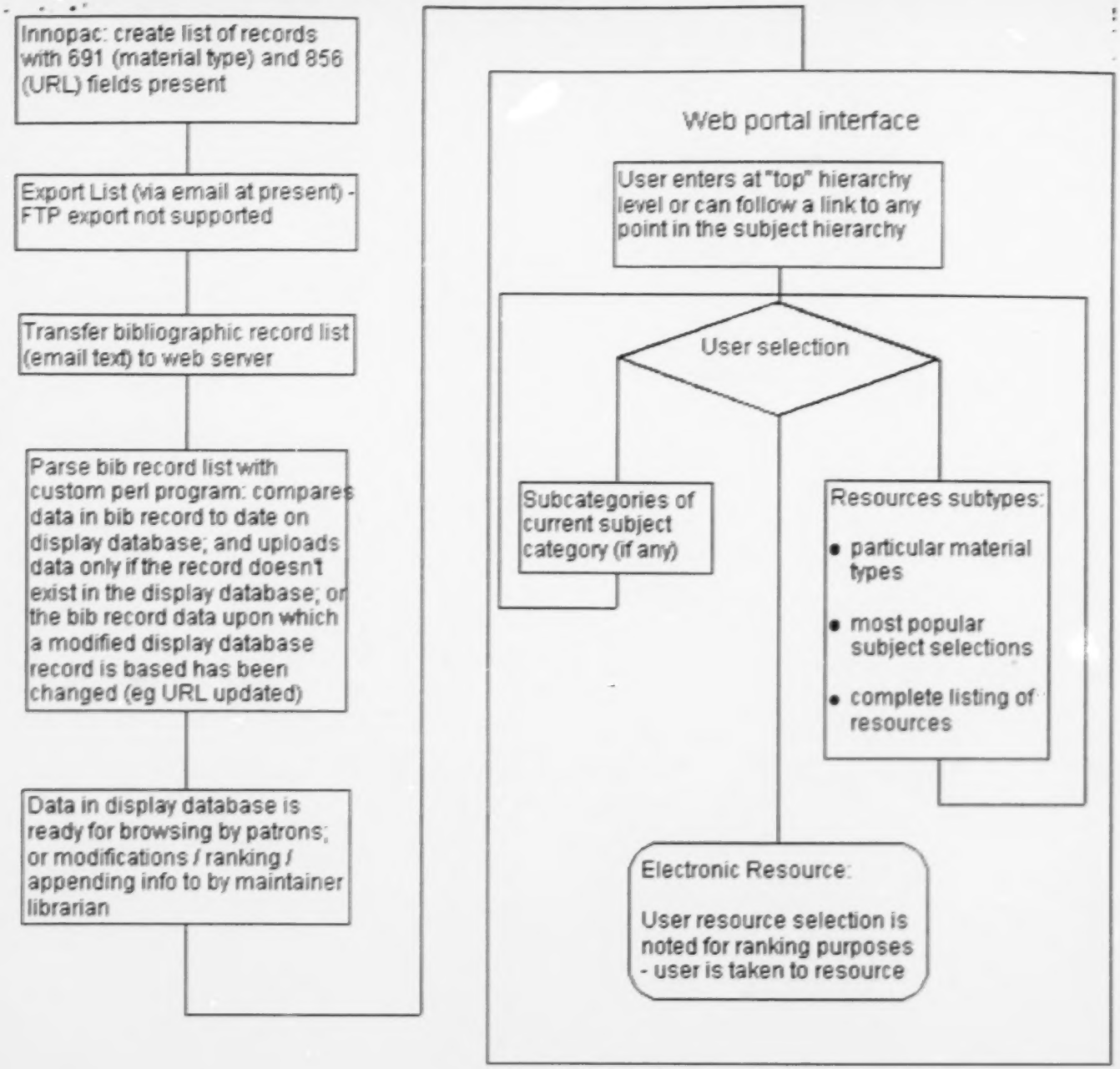
Good examples of university wide portals can be found at: Monash University http://my.monash.edu.au, University of Minnesota http://onestop.umn.edu, California Institute of Technology http://my.caltech.edu/portals, University of Michigan http://www.umich.edu/gateway.html and the UCLA http://my.ucla.edu.

Good examples of Library wide portals include:

- University of Washington - "My Gateway"

- This site is highly customisable and is developed in such a way that allows users to group resources according to their own usage patterns. It has an easy to use interface, which allows for an updating mechanism that alerts users to resources that have been added to the database since the user's last login and the ability to immediately add resources to the user's gateway profile as they encounter them in their searching. The data is primarily organised by hierarchical by subject but with the option to isolate items by format (e-journals, websites, catalogs, etc.
- University of Melbourne - "Buddy"
  Buddy is an integrated, subject-based database of the University of Melbourne's library resources. The system that has been created is not an interactive portal per se as it does not allow users to customise the presentation of the information. However, developing an integrated interface and underlying database incorporating all types of library resources (e-journals, databases, websites), is the first step in the development of a portal.
- University of Arizona - "SABIO"
  The Arizona library does not have a customisable portal per se but does have a "multi-search" option, which allows searches for "books and articles in different catalogs and indexes at the same time", the beginning of a portal.

One option for ANU has been to develop its own product based sourcing data from a wide range of sources including the catalogue, subject specific web pages and electronic database services. The following is a schematic representation of the way the database structure may develop.[xv]


Innopac: create list of records with 691 (material type) and 856 (URL) fields present
Export List (via email at present) - FTP export not supported
Transfer bibliographic record list (email text) to web server
Parse bib record list with custom perl program: compares data in bib record to date on display database; and uploads data only if the record doesn't exist in the display database; or the bib record data upon which a modified display database record is based has been changed (eg URL updated)
Data in display database is ready for browsing by patrons; or modifications / ranking / appending info to by maintainer librarian
Web portal interface
User enters at "top" hierarchy level or can follow a link to any point in the subject hierarchy
User selection
Subcategories of current subject category (if any)
Resources subtypes:
particular material types
most popular subject selections
complete listing of resources
Electronic Resource:
User resource selection is noted for ranking purposes - user is taken to resource

Future Challenges

Universities as well as libraries must begin to think more strategically about their use of the web and interactive portals within. The Library must now provide access and service to users who do not ever come to campus, it must create a brand image that is easily recognisable not only part of the institution as a whole but as a recognisable library service point. A questions that needs to be asked is whether administrative costs be reduced by building more interactive modes of access to data, information and services or whether the portals is simply a value-added service.[xvi]

Interactive portals and a strong Library web presence are vital to strengthen the role of the Library

as a point for resource discovery. While the value of a library as a physical space is now questionable, the value of the "hybrid" library as a value added provider of information is unquestionable. By realising that the development, adoption and integration of knowledge through a sharing interface such an interactive portal and a strong web presence, libraries can increase the availability and usability of their services and continue to increase their value and viability in an information rich but time poor society.

Footnotes

i Miller, R.G. and Zhou, P.X., "Global Resource Sharing: A Gateway Model", in *The Journal of Academic Librarianship*, Volume 25, Number 4, pages 281-287

ii ibid

iii MacKenzie Owen, J.S. and Wiercx, A., (1996), (NBBI), *Knowledge Models for Networked Library Services, Final Report* Version 1.0, January, Project Bureau for the Information management in the Netherlands (Contract PROBLIB/KMS 10119)

iv Looney, M., and Lyman., (2000), "Portals in Higher Education", *Educause*, July/August

v Missingham, R., (2000), "Potals Down Under: Discovery in the Digital Age", *EContent*, April/May, Volume 23 - Number 2, pp.41-48

vi Ruber, (1999), "Portals keep utilities plugged in", *Internetweek*, No. 788, p25.

vii Antelman, K., (1999), "Getting Out of the HTML Business: the Database Driven Web Site Solution', *Information Technology and Libraries*, December, pp. 178

viii Myers, P.S., (eds), (1996), *Knowledge Management and Organisational Design*, Butterworth-Heinemann, Boston

ix Ruggles-III, R., (1997) *Knowledge Management Tools*, Butterworth-Heinemann, Boston

x Antelman, K., (1999), "Getting Out of the HTML Business: the Database Driven Web Site Solution', *Information Technology and Libraries*, December, pp. 176-181

xi ibid, p. 177

xii Connolly, C., (2000), "From Static Web Site to Portal", *Educause Quarterly*, Number 2, pp. 39-43

xiii Information on the Portal Development Program has been taken from an internal ANU document entitled: *Electronic Information Access and Integrated Portal Approach - Changing the Scholarly Model*

xiv The schematic was produced by the ANU Library's web developer Grant Ozolins

xv Looney, M., and Lyman., "Portals in Higher Education", *Educause*, July/August pp. 29-36

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